Amendments to the Claims

Please cancel claims 1-30 and add new claims 31-65 as follows:

31. A method to detect directly an effect caused by a population of organisms, comprising the steps of:

a) determining an enzymatic activity specifically shared by the population of organisms responsible for said effect;

b) selecting a substrate transformable by the shared enzymatic activity determined at step a);

c) collecting a sample suspected to contain said population of organisms;

d) contacting said collected sample with the substrate selected at step b); and

e) detecting and optionally quantifying the amount of transformed substrate;

wherein said method is performed in the absence of any culture step.

32. The method of claim 31, wherein the sample is collected on a surface or in a liquid.

33. The method of claim 32, wherein the surface is any part of an object, food, plant, animal or human body.

34. The method of claim 33, wherein the part of the animal or human body is skin, hair, nails, eyes, teeth, or mucous membranes.

35. The method of claim 32, wherein the liquid is from food, plants, industrial wastes, or from an animal or human body.

36. The method of claim 31 wherein the population of organisms is a population of microorganisms.

37. The method of claim 36, wherein the population of micoorganisms comprises bacteria, fungi, yeasts, viruses, protists, archaebacteria, or eukaryotes.

38. The method of claim 31, wherein the enzymatic activity is caused by oxidoreductases, transferases, hydrolases, lyases, isomerases, ligases, or combinations thereof.

39. The method of claim 31, wherein the enzymatic activity is the activity of reductase, alcohol dehydrogenase, alcohol oxidase, amino acid oxidase, monooxygenase, dioxygenase, amidase, acylase, lyase, xylanase, proteases, nitrilase, nitrile hydratase, epoxide hydrolase, lipase, esterase, or mixtures thereof.

40. The method of claim 31, wherein the enzymatic activity is the activity of lipase and esterase and the effect is an odor.

41. The method of claim 38, wherein the selected substrate is a derivative of 4-nitrophenyloxy-1,2-butanediol or 4-umbelliferyloxy-1,2-butanediol and can be transformed by the enzymatic activity.

42. The method of claim 38, wherein the transformable substrate is an ester when the population of organism shares an esterase activity.

43. The method of claim 39, wherein the ester is a 2-hydroxy-4-p-nitrophenoxy-butyl carboxylic acid ester.

44. The method of claim 41, wherein the 2-hydroxy-4-p-nitrophenoxy-butyl carboxylic acid ester is 2-hydroxy-4-p-nitrophenoxy-butyl hexanoate or 2-hydroxy-4-p-nitrophenoxy-butyl decanoate.

45. The method of claim 38, wherein the transformable substrate is casein resorufin when the population of organism shares a protease activity.

46. The method of claim 31, wherein the transformed substrate is directly detectable, or it is detectable after at least one additional step following the enzymatic step.

47. The method of claim 31, wherein the amount of transformed substrate is compared with an amount of transformed substrate obtained in a least one control.

48. A method for the evaluation of the activity of a substance of interest expected to act on a population of organisms, wherein the method comprises the steps of:

a) determining an enzymatic activity specifically shared by the population of organisms responsible for said effect;

b) selecting a substrate transformable by the shared enzymatic activity determined at step a);

c) collecting a sample suspected to contain said population of organisms;

d) contacting said collected sample with the substrate selected at step b); and

e) detecting and optionally quantifying the amount of transformed substrate;

wherein said method is performed in the absence of any culture step;

wherein steps a) to e) are performed before and after contacting said substance with the surface or liquid containing the population of organisms; and

wherein the variation in the amount of transformed substrate is measured.

49. A method for the evaluation of the activity of a substance of interest expected to act on a population of organisms, wherein the method comprises the steps of:

a) determining an enzymatic activity specifically shared by the population of organisms responsible for said effect;

b) selecting a substrate transformable by the shared enzymatic activity determined at step a);

c) collecting a sample suspected to contain said population of organisms;

d) contacting said collected sample with the substrate selected at step b); and,

e) detecting and optionally quantifying the amount of transformed substrate;

wherein said method is performed in the absence of any culture step;

wherein steps a) to e) are performed in the presence and in the absence of said substance; and,

wherein the variation in the amount of transformed substrate is measured.

50. The method of claim 48, wherein said substance and said sample are put together before the collection of said sample.

51. The method of claim 48, wherein said substance and said sample are put together after the collecting of said sample.

52. A screening method of different substances of interest expected to act on a population of organisms, wherein the method comprises the steps of:

a) determining an enzymatic activity specifically shared by the population of organisms responsible for said effect;

b) selecting a substrate transformable by the shared enzymatic activity determined at step a);

c) collecting a sample suspected to contain said population of organisms;

d) contacting said collected sample with the substrate selected at step b); and

e) detecting and optionally quantifying the amount of transformed substrate;

wherein said method is performed in the absence of any culture step; and,

wherein steps a) to e) are performed with said substances and wherein a best substance is selected based on the amount of substrate transformed.

53. The method of claim 48, wherein the substance of interest is a chemical, biological, pharmaceutical, cosmetic, veterinary or agricultural substance.

54. The method of claim 53, wherein the substance of interest is an antimicrobial substance.

55. The method of claim 54, wherein the substance of interest is an anti-acne composition, a deodorant or a shampoo

56. The method of claim 55, wherein the shampoo is an anti-dandruff shampoo.

57. A kit for the detection of an effect caused by a population of organisms according to a method comprising the steps of:

a) determining an enzymatic activity specifically shared by the population of organisms responsible for said effect;

b) selecting a substrate transformable by the shared enzymatic activity determined at step a);

c) collecting a sample suspected to contain said population of organisms;

d) contacting said collected sample with the substrate selected at step b); and

e) detecting and optionally quantifying the amount of transformed substrate;

wherein said method is performed in the absence of any culture step;

said kit comprising:

a) a sampling tool;

b) a substrate transformable by an enzymatic activity shared by said population of organisms; and

c) optionally at least one sample control;

58. The kit of claim 57, further comprising reagents for the detection of the transformable substrate.

59. The kit of claim 57, wherein the population of organisms is cultivable

60. The kit of claim 57, wherein the population of organisms is not cultivable

61. The kit of claim 58, wherein the population of organisms is cultivable

62. The kit of claim 58, wherein the population of organisms is not cultivable

63. The kit of claim 57, said kit comprising:

a) sample tool;

a) 2-hydroxy-4-p-nitrophenoxy-butyl decanoate;

b) at least one sample control; and

c) reagents for the detection of the 2-hydroxy-4-p-nitrophenoxy-butyl decanoate.

64. The method of claim 31, wherein the population of organisms is detected, quantified, or both detected and quantified.

65. The method of claim 31, wherein the activity of a substance of interest is evaluated.